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Elahmadie

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(54) **EXERCISE ENHANCEMENT MACHINE**

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A63B 22/06	(2006.01)
A63B 69/16	(2006.01)
A63B 71/00	(2006.01)

(52) **U.S. Cl.**
USPC **482/5**; 482/57; 482/1; 482/51

(58) **Field of Classification Search**
USPC 482/1–9, 57, 72–73, 51, 52, 71, 78
See application file for complete search history.

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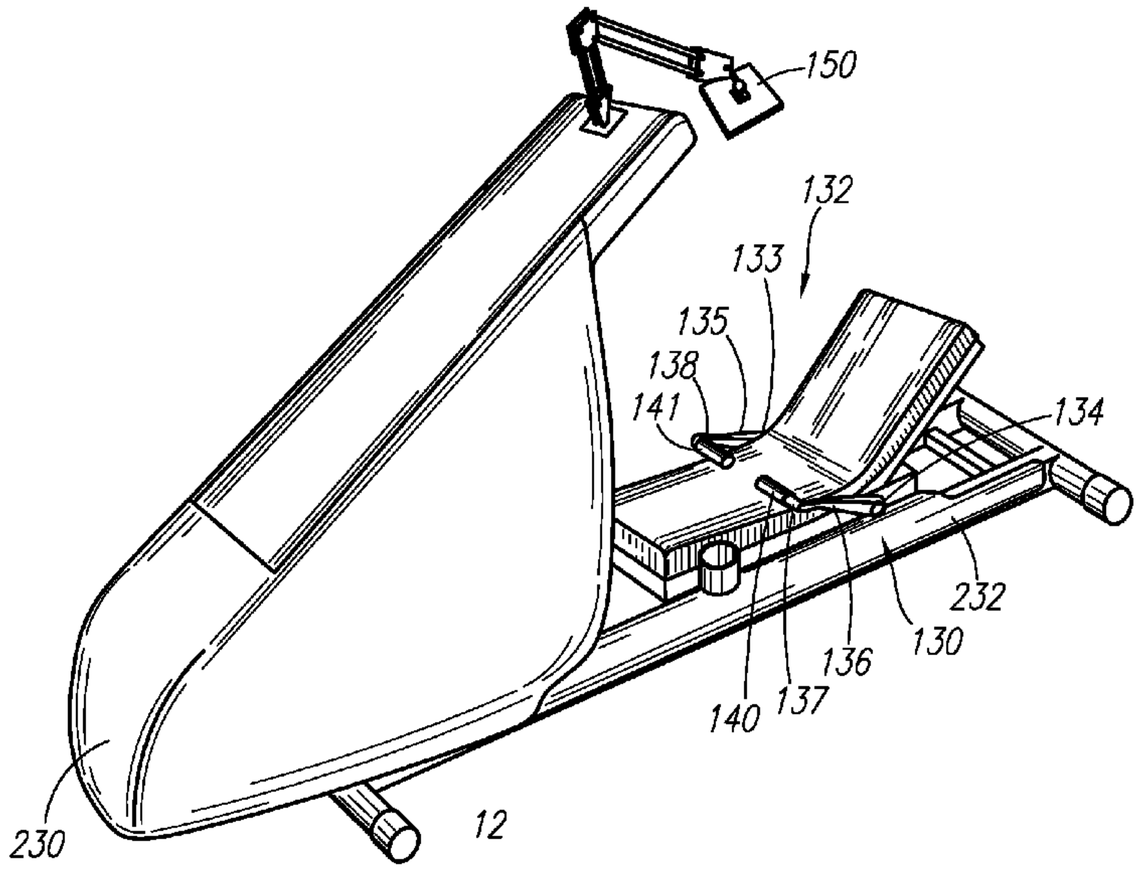
(57) **ABSTRACT**

An exercise machine includes a frame, an adjustable seat assembly, a means for slidably adjusting the seat assembly axially along the frame, a means for pivotally adjusting the seat assembly between a generally upright position and a recumbent position, an adjustable resistance assembly which includes rotatable pedals, and a display panel with means for providing omnidirectional positionability of the display panel. The exercise machine allows a user thereof to simultaneously perform crunching exercises and actively engage the adjustable resistance assembly in order to allow the user to reach the highest, optimized levels of cardiovascular fitness and calorie burning during a physical exercise interval.

13 Claims, 7 Drawing Sheets



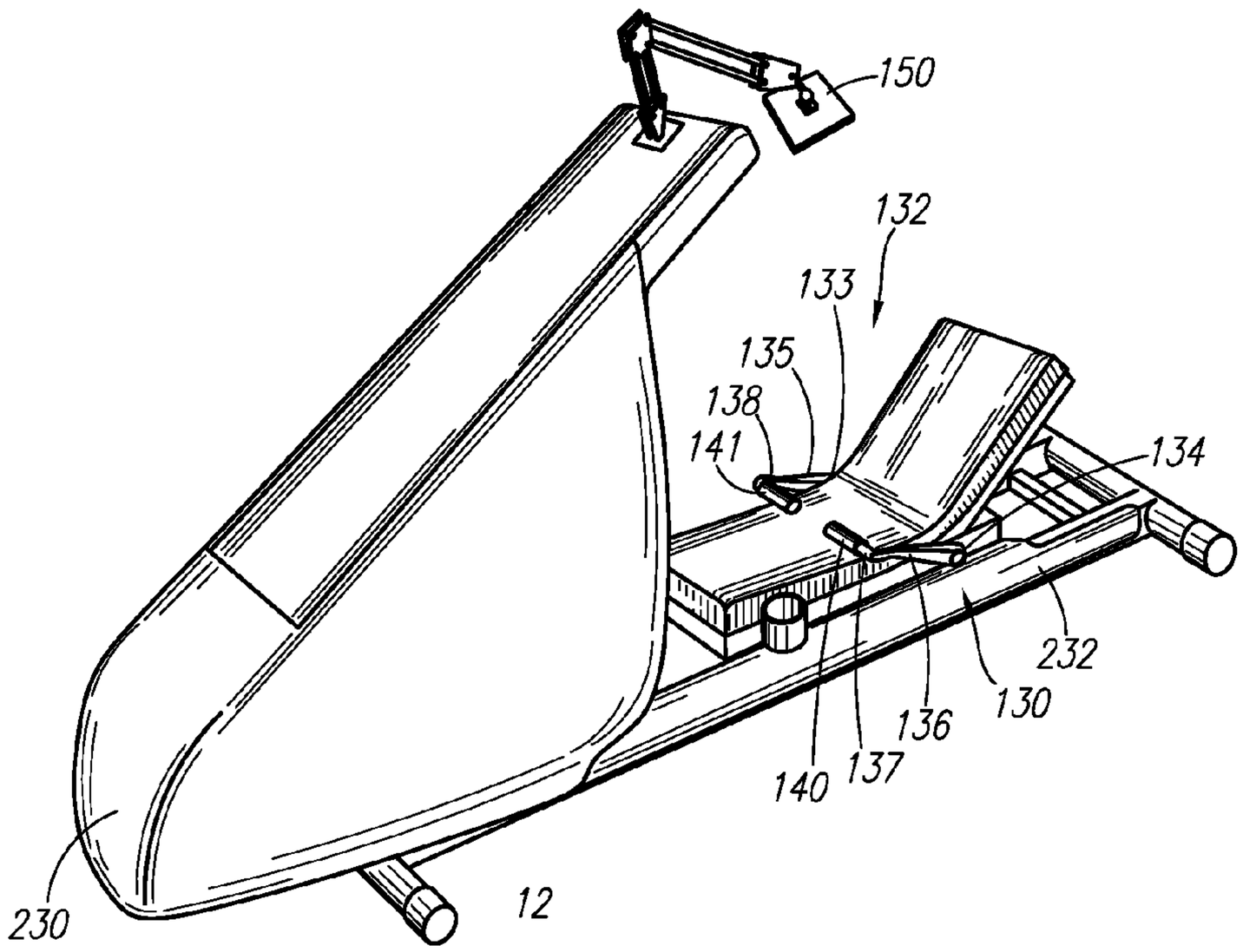

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FIG. 1

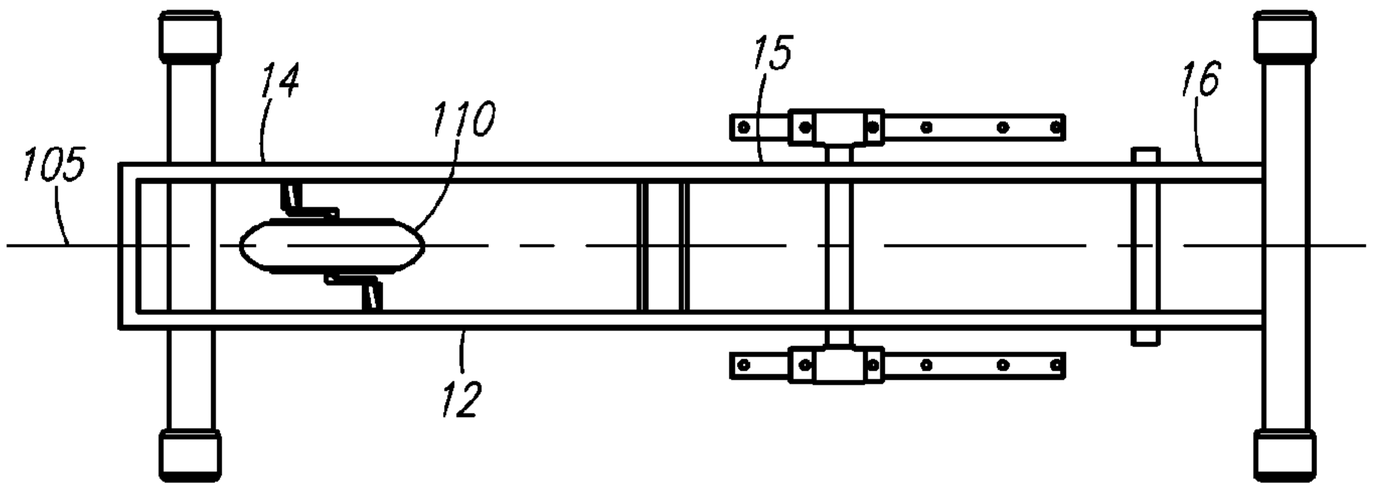
14
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FIG. 2

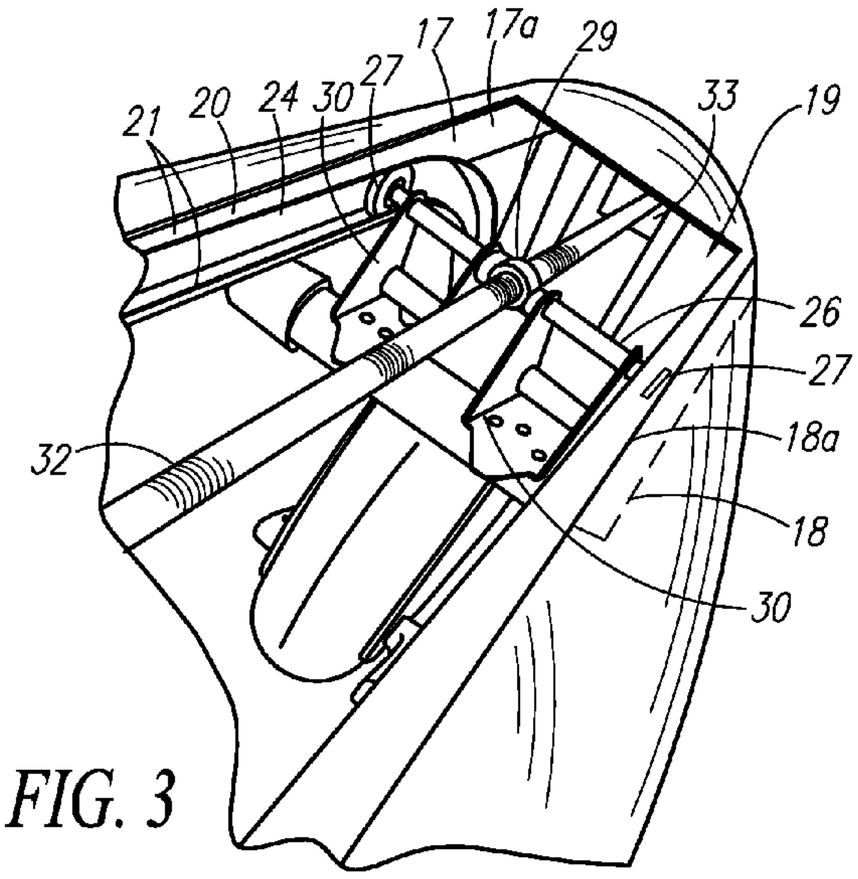


FIG. 3

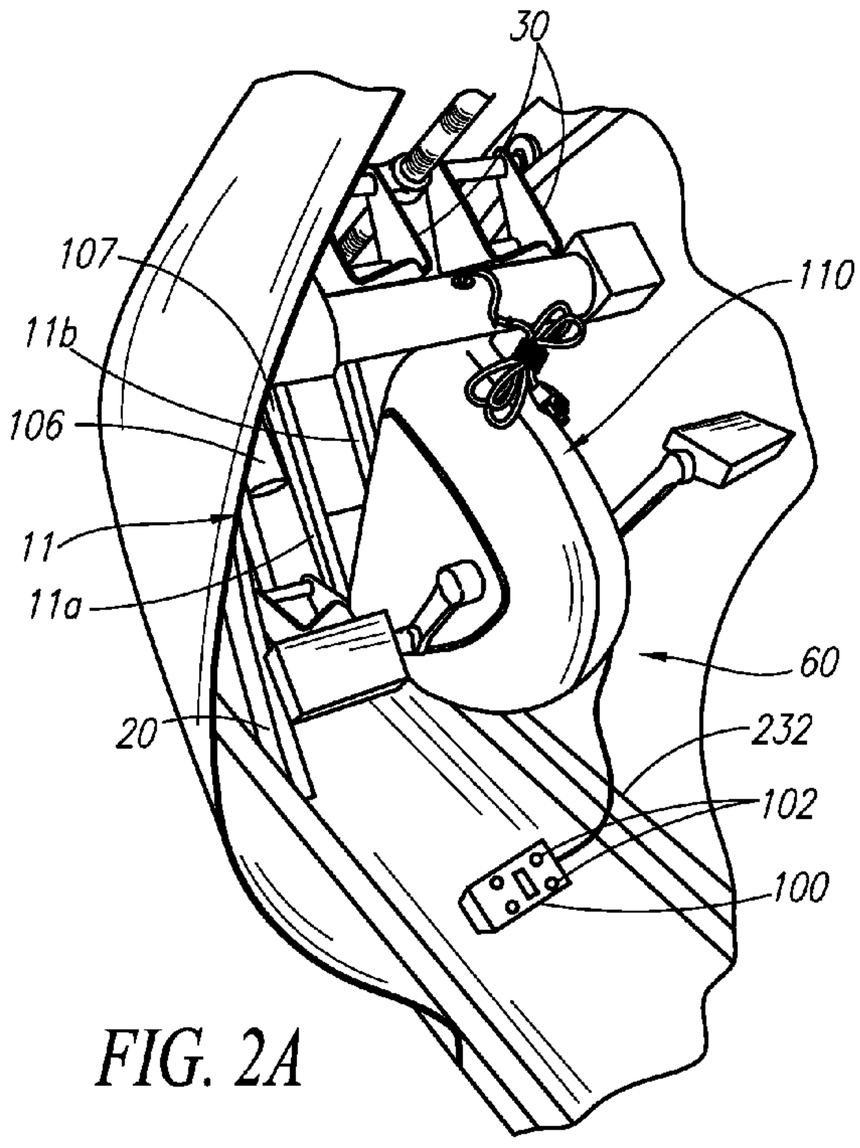


FIG. 2A

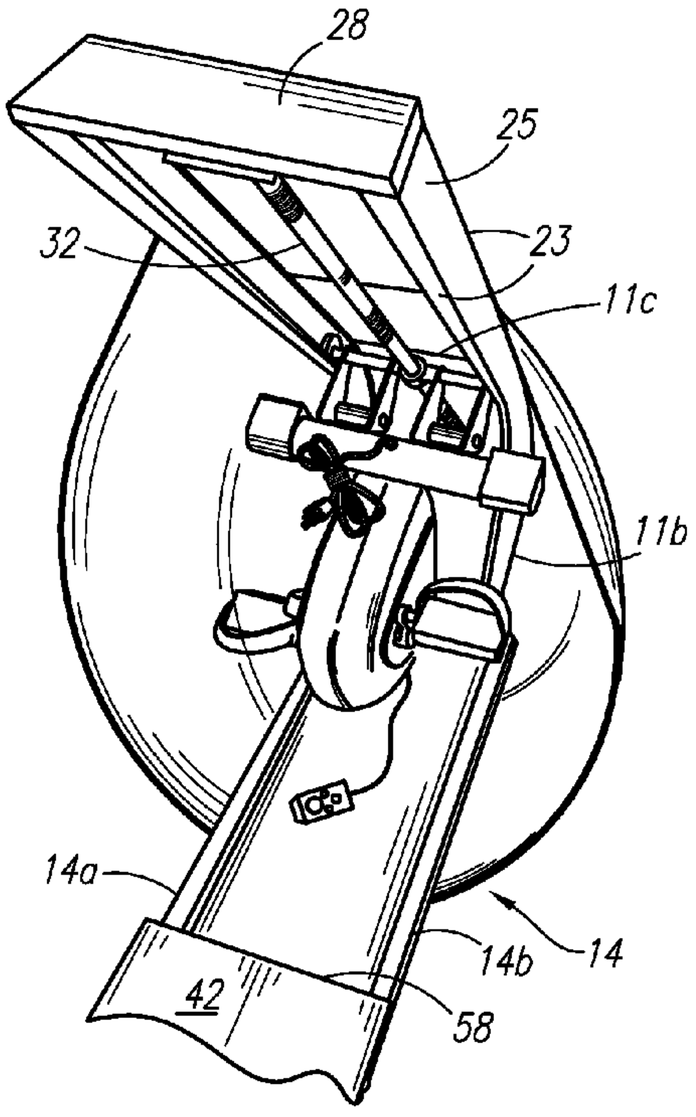


FIG. 4

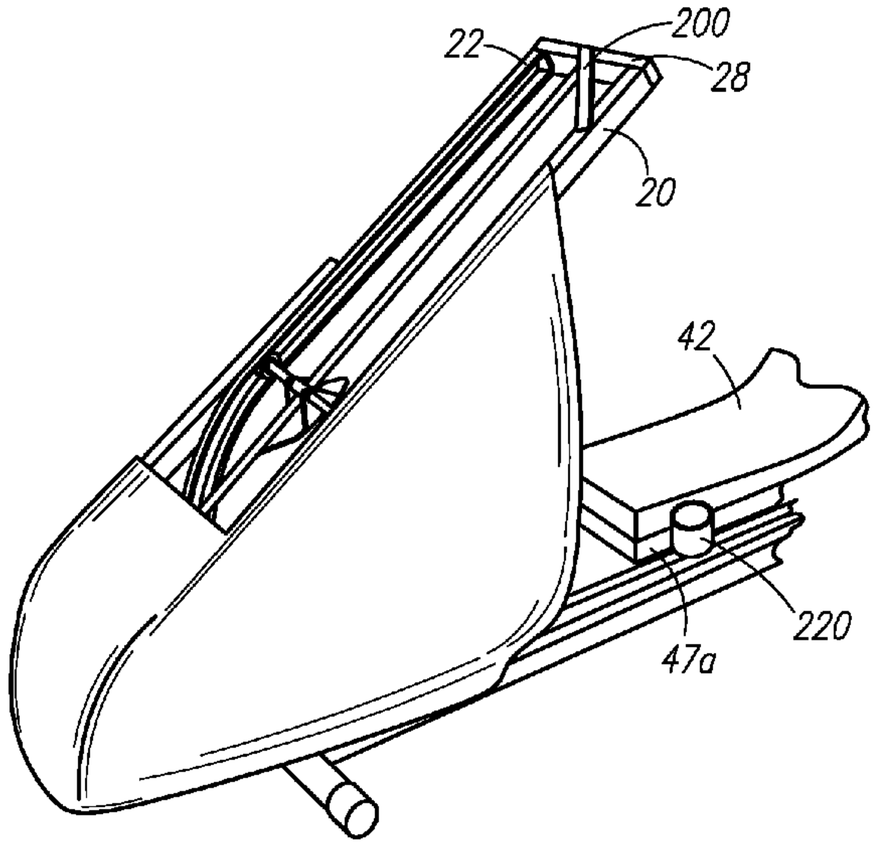


FIG. 5

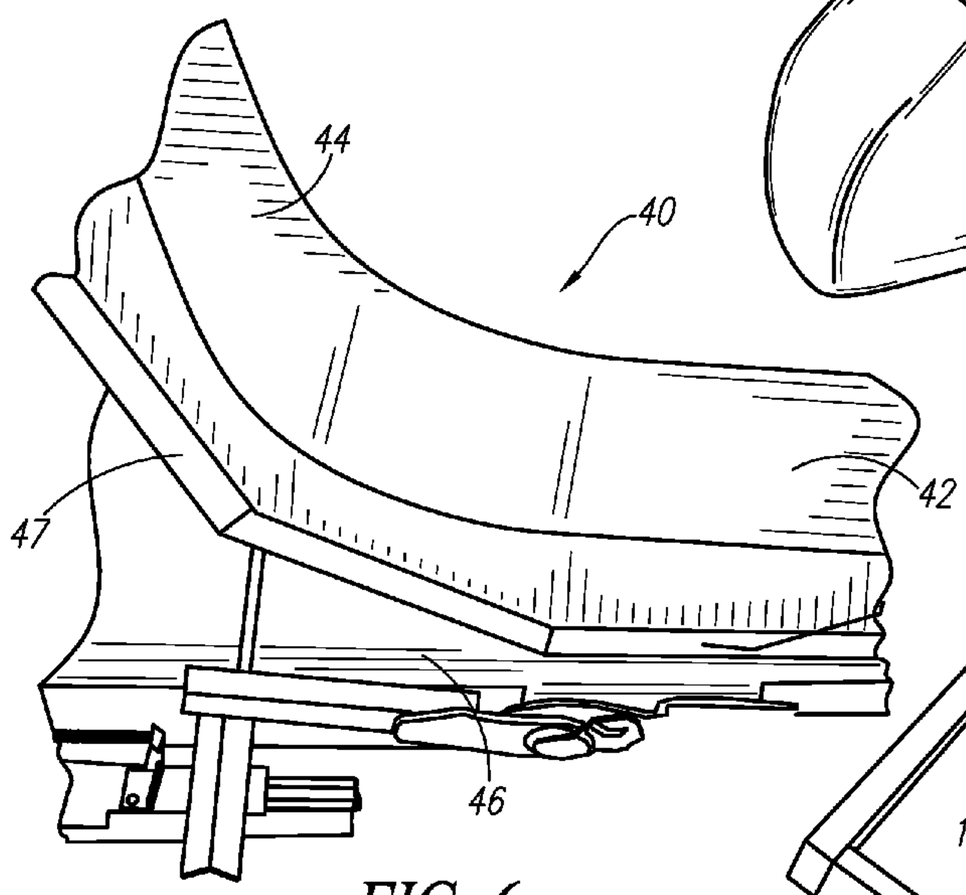


FIG. 6

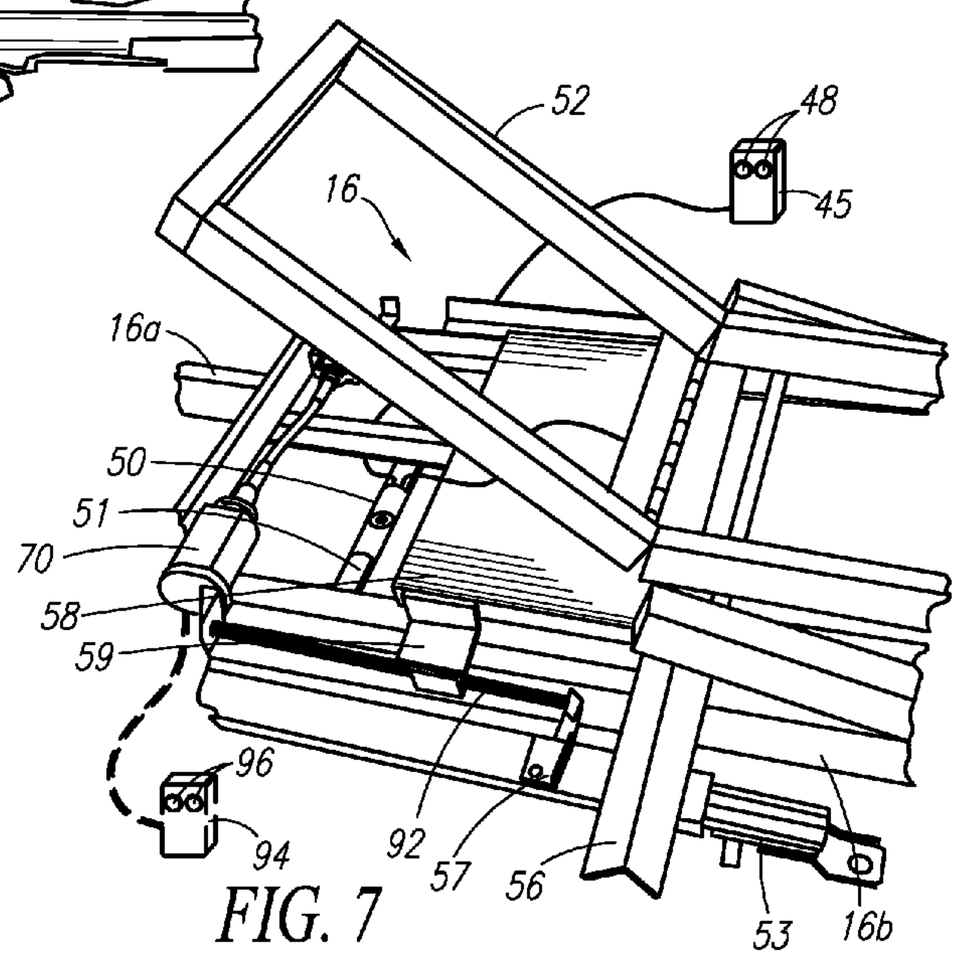


FIG. 7

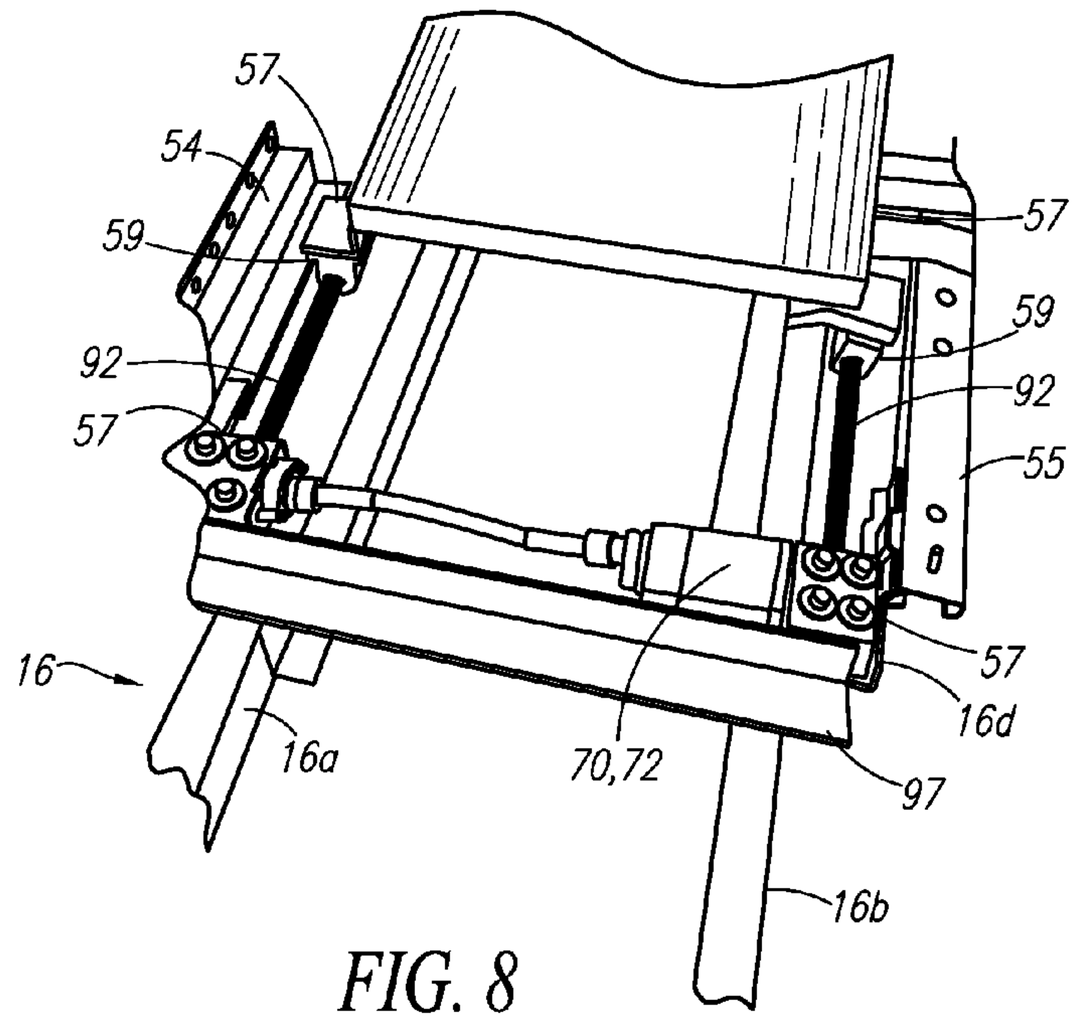


FIG. 8

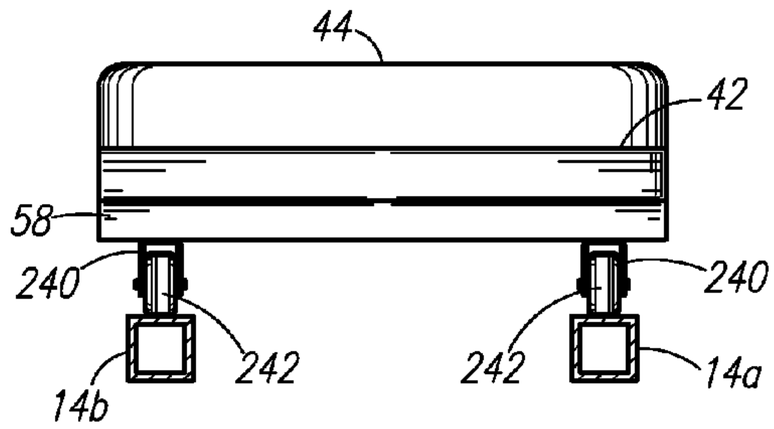


FIG. 8A

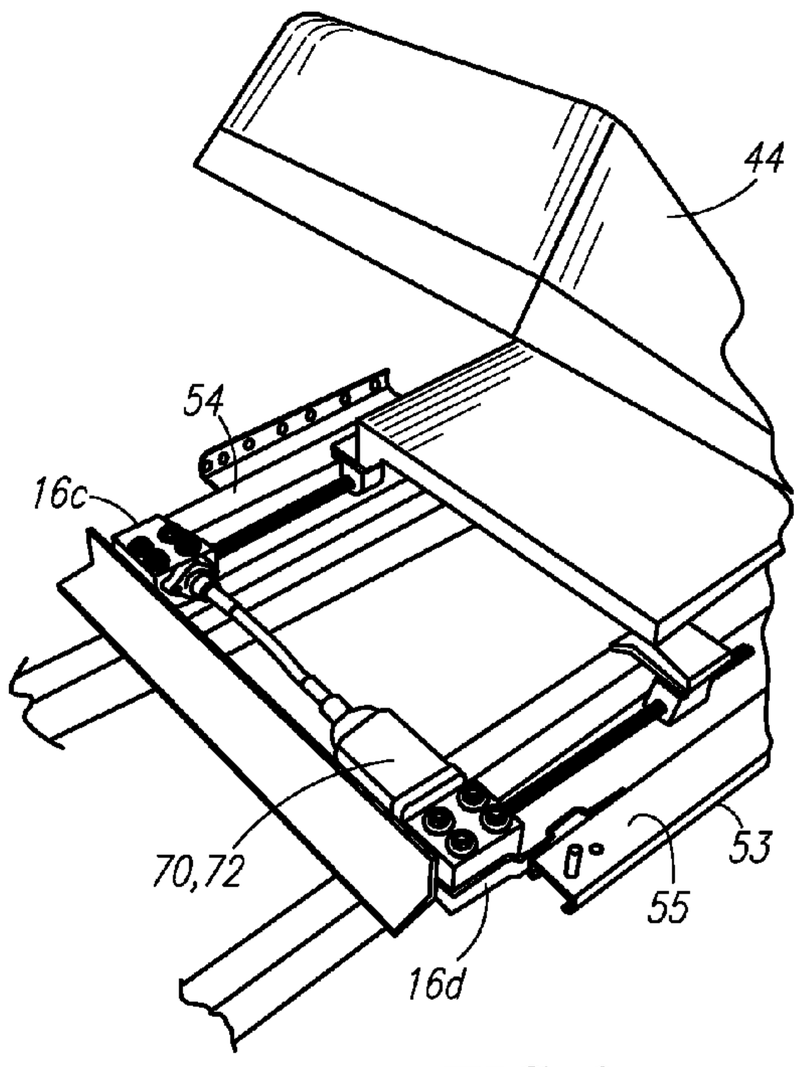
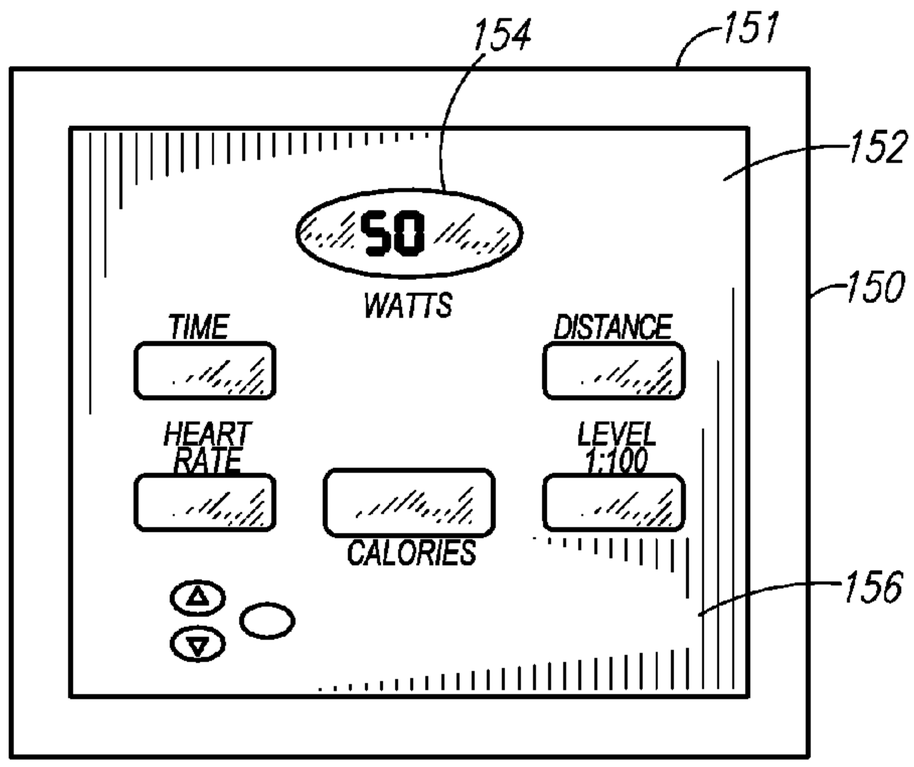


FIG. 9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150
50
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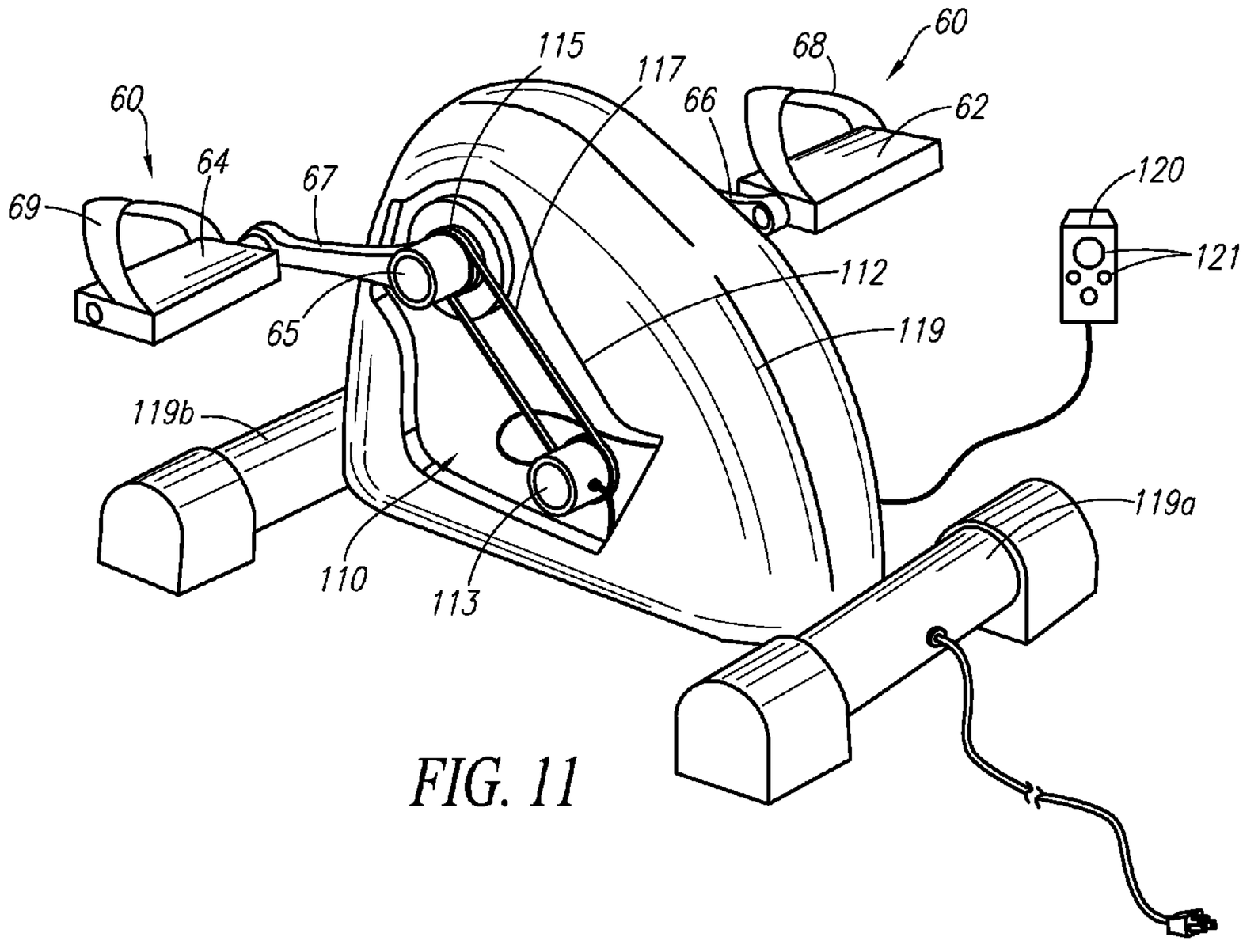
TIME
DISTANCE
HEART RATE
CALORIES
LEVEL 1:100
156

FIG. 10


60
115
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62
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69
120
121
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119
119b
119a
110
113

FIG. 11

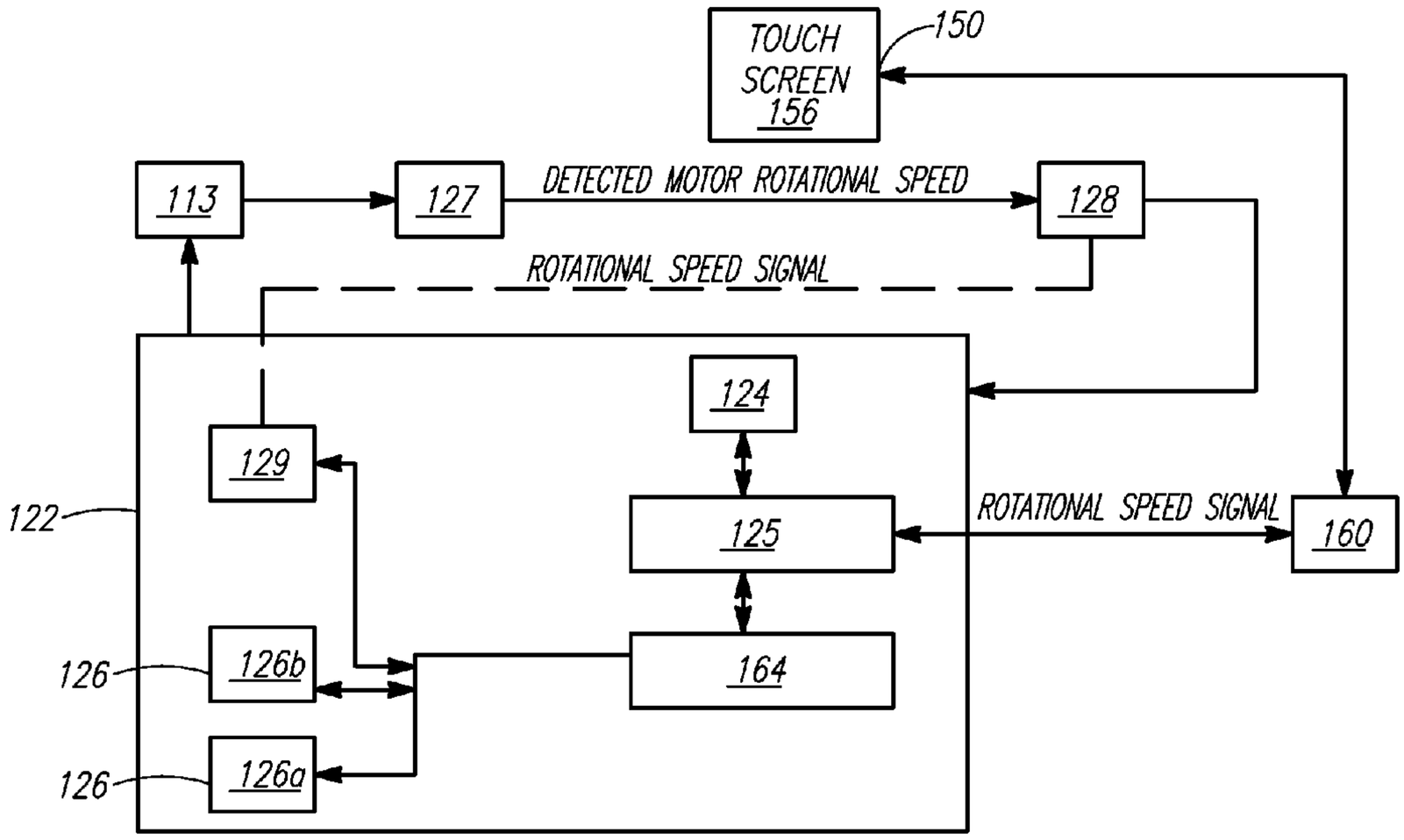

FIG. 12

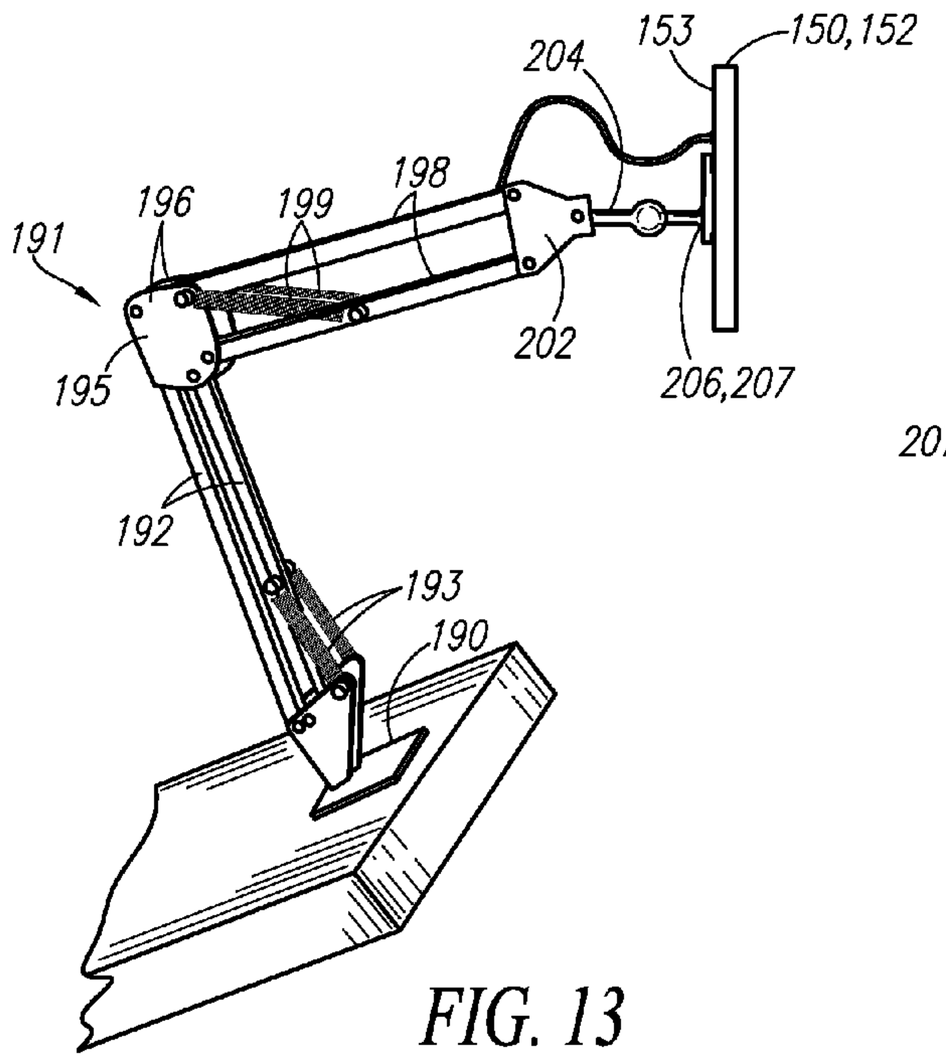

FIG. 13

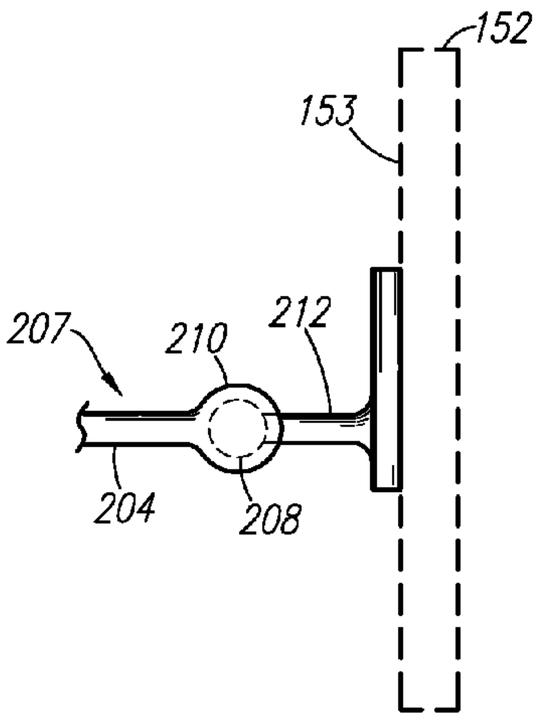

FIG. 14

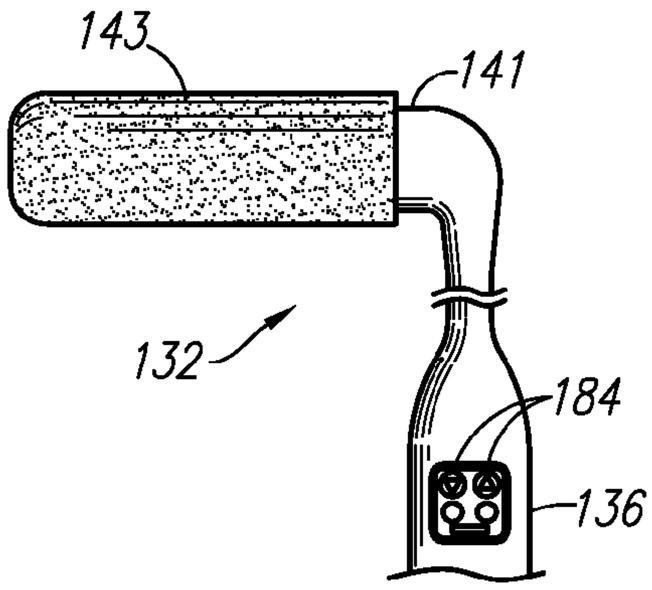

FIG. 15

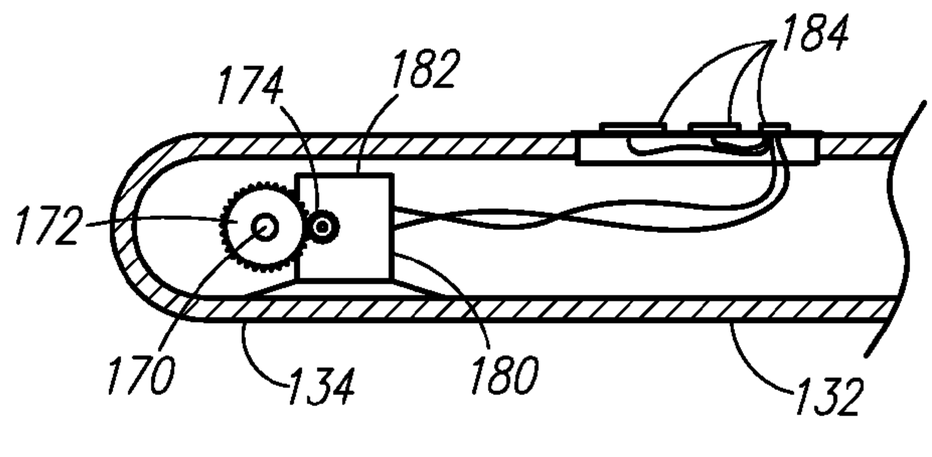

FIG. 16

EXERCISE ENHANCEMENT MACHINE

RELATED APPLICATIONS

There are no previously filed, nor currently any co-pending applications, anywhere in the world.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to exercise equipment and accessories therefor, and more particularly, to an exercise machine configured to enhance cardiovascular fitness, physical fitness, and calorie burning during a physical exercise training interval.

2. Description of the Related Art

Currently there exist in the art various equipment for fitness exercise, physical therapy, and stress testing. However, the prior art has failed to disclose or teach an exercise machine having a seat assembly with a back rest being pivotally adjustable to a recumbent position, and a resistance assembly, thereby allowing a user to simultaneously perform crunching exercises and actively engage the resistance assembly in order to maximize the possibility of a user reaching the highest, optimized levels of cardiovascular fitness and calorie burning during a physical exercise interval.

In addition, the prior art has failed to teach or disclose an exercise machine which includes a display panel mounted to exercise machine via a mounting assembly with means for providing omnidirectional positionability of the display panel.

Accordingly, a need exists for an exercise machine which allows for cardiovascular and/or resistance training to be engaged in while concurrently lying in a recumbent position and performing crunching exercises so as to maximize the possibility of a user reaching the highest, optimized levels of cardiovascular fitness and calorie burning during a physical exercise interval. The development of the exercise enhancement machine fulfills this need.

A search of the prior art did not disclose any patents that read directly on the claims of the instant invention; however, the following references were considered related:

U.S. Pat. No. 6,361,479 B1, issued in the name of Hildebrandt et al.;

U.S. Pat. No. 5,746,684, issued in the name of Jordan;

U.S. Patent Application no. 2010/0022354 A1, published in the name of Fisher;

U.S. Patent Application no. 2005/0032608 A1, published in the name of Glusco;

U.S. Pat. No. 5,700,228, issued in the name of James;

U.S. Patent Application no. 2005/0164838 A1, published in the name of Watterson et al.;

U.S. Pat. No. 5,313,942, issued in the name of Platzker;

U.S. Pat. No. D621,889 S, issued in the name of Horita et al.; and

U.S. Pat. No. 5,439,433, issued in the name of Lundin et al.

Consequently, a need has been felt for an exercise machine which allows for cardiovascular and/or resistance training to be engaged in while concurrently lying in a recumbent position and performing crunching exercises so as to maximize the possibility of a user reaching the highest, optimized levels of cardiovascular fitness and calorie burning during a physical exercise interval.

This application presents claims and embodiments that fulfill a need or needs not yet satisfied by the products, inventions and methods previously or presently available. In particular, the claims and embodiments disclosed herein

describe an exercise machine comprising a frame for supporting a seat assembly, the seat assembly comprising a seat and a back rest, the back rest being pivotally adjustable between a generally upright position and a recumbent position; means for sliding the seat assembly axially along the frame of the exercise machine; a resistance assembly; an adjustable resistance mechanism; and an input means mounted to exercise machine via a mounting assembly with means for providing omnidirectional positionability of the input means, the exercise machine providing unanticipated and nonobvious combination of features distinguished from the products, inventions and methods preexisting in the art. The applicant is unaware of any product, method, disclosure or reference that discloses the features of the claims and embodiments disclosed herein.

SUMMARY OF THE INVENTION

Briefly described according to one embodiment of the present invention, an exercise machine is disclosed, the exercise machine comprises a frame which includes a front support, a rear support, and central support integrally joining front and rear support. The frame further includes a shroud portion extending between the front and central supports, the shroud portion partially encloses a carriage assembly and an adjustable resistance mechanism.

The exercise machine further comprises a seat assembly adjustably mounted to the frame. The seat assembly comprises a seat and a back rest, the back rest is pivotally adjustable to assume a number of positions. The seat is positionable to a recumbent position, thereby allowing user to perform a crunching exercise while simultaneously actively engaging the resistance assembly using user's feet.

A means for sliding the seat assembly axially along the frame of the exercise machine is further provided.

The resistance assembly comprises pedals, such as rotatable pedals, connected to an adjustable resistance mechanism which applies a constant resistance or work load. The adjustable resistance mechanism comprises a drive system enclosed by a housing. The drive system is controlled via an electronic control unit electrically connected thereto. The electronic control unit includes a plurality of control buttons by which user may input his/her desired level of resistance or work load. Alternatively, users may input desired resistance via an input means. The input means, according one embodiment, is a display panel comprising a touch sensitive screen. The display panel is mounted to the exercise machine via a mounting assembly with means for providing omnidirectional positionability of the display panel.

A carriage control unit, electrically connected to the drive system, controls inclined translation of carriage assembly about an incline plane, hence controlling translation of pedals to a selectively-desired inclined height.

BRIEF DESCRIPTION OF THE DRAWINGS

The advantages and features of the present invention will become better understood with reference to the following more detailed description and claims taken in conjunction with the accompanying drawings, in which like elements are identified with like symbols, and in which:

FIG. **1** is a left frontal perspective view of an exercise machine, according to one embodiment of the present invention;

FIG. **2** is a bottom plan view of the frame showing the adjustable resistance mechanism of the exercise machine secured thereto, in accordance to one embodiment of the present invention;

FIG. **2**A is a partial left perspective view of the exercise machine illustrating the resistance assembly, the exercise machine shown with the shroud partially removed, in accordance to one embodiment of the present invention;

FIG. **3** is a partial top left side view of the exercise machine of FIG. **1** illustrating a carriage assembly, the exercise machine shown with the shroud partially removed;

FIG. **4** is a rear perspective view of the exercise machine illustrating components of the carriage assembly, the exercise machine shown with the shroud partially removed, in accordance to one embodiment of the present invention;

FIG. **5** is a left frontal perspective view of the exercise machine, shown with the shroud partially removed, in accordance to one embodiment of the present invention;

FIG. **6** is a right side elevational view of a seat assembly, illustrating the pivot axes thereof, in accordance to one embodiment of the present invention;

FIG. **7** is a partial right perspective view of the seat assembly, shown with cushion portion removed, illustrating one means for sliding the seat assembly axially along the frame of the exercise machine, in accordance to one embodiment of the present invention;

FIG. **8** is a partial rear perspective view of the seat assembly of FIG. **7**;

FIG. **8**A is a partial front end elevational view of the seat platform shown rotatably engaged with the front support members of frame, according to one embodiment of the present invention;

FIG. **9** is a partial right rear perspective view the seat assembly illustrating one means for sliding the seat assembly axially along the frame of the exercise machine, in accordance to one embodiment of the present invention;

FIG. **10** is a front view of an input means, shown herein as a display panel having a touch sensitive screen, in accordance to one embodiment of the present invention;

FIG. **11** is a partial cut away view of an adjustable resistance mechanism, according to one embodiment of the present invention;

FIG. **12** is a detailed block diagram of an electronic resistance circuit, according to one embodiment of the present invention;

FIG. **13** is a side elevational view of a display panel coupled to exercise machine via a panel adjustment assembly with means for providing display panel with omnidirectional positionability, in accordance to one embodiment of the present invention;

FIG. **14** is a side elevational view of a joint assembly, in accordance to one embodiment of the present invention;

FIG. **15** is a partial top plan view of one of the pair of adjustable handles illustrating control buttons for actuating pivotal movement by the pair of adjustable handles, in accordance to one embodiment of the present invention; and

FIG. **16** is a partial cross-sectional view of one of the pair of adjustable handles showing means disposed therein for pivotally moving the handles between raised and lowered positions, in accordance to one embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Detailed Description of the Figures

Referring now to FIGS. **1-2**, an exercise machine **10** is shown, according to one embodiment of the present invention. The exercise machine **10** comprises a frame **12** which includes a front support **14** and a rear support **16**. The front support **14** is spaced from the rear support **16** generally along a central axis **105**. Preferably, the frame **12** is constructed of tubular steel, but may also be made from steel in various stock forms such as plate stock and angle stock. The front support **14** and rear support **16** are integrally joined by a central support **15**. The front support **14**, central support **15**, and rear support **16** may collectively define generally an H-shaped configuration.

Referring now more specifically to FIGS. **2-5**, a carriage assembly support frame **11** is provided for supporting a carriage assembly **19**. Support frame **11** comprises a first and second vertical member **11***a* and **11***b* mounted to the front support **14** of frame **12** about respective lower ends thereof. The first and second vertical members **11***a* and **11***b* each having upper ends welded or molded integral to a cross member **11***c*. A first and a second stanchion **17** and **18** each having lower ends respectively mounted or welded to outer walls of first and second vertical member **11***a* and **11***b*.

The carriage assembly **19** comprises a transverse support rod **26** and tracks **20** and **22**. The support rod **26** having ends rotatably mounted with guide rollers **27** by means of bearings disposed therein. The tracks **20** and **22** are respectively mounted to the inside side walls **17***a*, **18***a* of the first and second stanchion **17** and **18**. The tracks **20** and **22** are generally C-shaped and each comprises a pair of flanges **21** and **23** joined by a central web **24**, **25**. The flanges **21** and **23** provide bearing surfaces on which the guide rollers **27** rotatably engage. The tracks **20** and **22** are further defined as having curved lower ends. Upper ends of the tracks **20** and **22** are mounted to a cross member **28**. A panel adjustment assembly support **200** or mounting plate is securably mounted, such as by arc welding, transversely to the upper surface of track **20** and sidewall of cross member **28**. The panel adjustment assembly support **200** (FIG. **5**) shall be described later in greater detail.

The carriage assembly **19** further comprises a pair of support brackets **30** for securably supporting a resistance assembly **60**, which includes an adjustable resistance mechanism **110** (to be described later in greater detail). The support brackets **30** are mounted spatially about the transverse support rod **26** and include a lower surface edge to which the front member **119***a* of housing **119** of resistance mechanism **110** is suitably mounted. Inside walls of the brackets **30** are joined by an annular collar **29** suitably mounted, such as by arc welding, therebetween for threaded translation along a guide rod **32**. The guide rod **32** is rotatably mounted perpendicularly between cross member **28** and a receiver **33** mounted to the front support **14**, wherein guide rod **32** includes male threads being threadedly engaged by annular collar **29**. The guide rod **32** is electrically connected to a driving means **106**, whereupon actuation of driving means **106** causes guide rod **32** to rotate either clockwise or counterclockwise. Rotation by guide rod **32** in one direction causes annular collar **29** to translate about guide rod **32** in a sloped or inclinational direction, thereby causing adjustable resistance mechanism **110** to translate in one inclinational direction, and rotation by guide rod **32** in the opposite direction causes adjustable resistance mechanism **110** to translate in the opposite inclinational direction.

The frame **12** further includes a shroud portion **230**, extending between the front and central supports **14** and **15**, which partially encloses the carriage assembly **19** and adjustable resistance mechanism. The shroud portion **230** is further defined has having a generally conical shape having an elongated sloped forward segment covering outer walls of tracks **20**, **22** and cross member **28**. The shroud portion **230** includes lower opposed ends extending integrally into linearly elon-

gated opposing strips **232** for covering central support **15** and rear support **16** of frame **12**. The shroud portion **230** provides the exercise machine **10** with an aerodynamic, cutting edge shape.

Referring now more particularly to FIGS. **5-9**, the exercise machine **10** further comprises a seat assembly **40** adjustably mounted to the frame **12**. An electric drive assembly **70** (to be described later in greater detail) is actuated for sliding the seat assembly **40** axially along the frame **12** for varied position adjustment.

The seat assembly **40** comprises a seat **42** and a back rest **44**, the back rest **44** is pivotally adjustable about a first and second pivot axis **46** and **47** to assume a number of positions, via a back rest pivot control **45**, the back rest **44** being adjustable between a generally upright position and a recumbent position (substantially flat or horizontal). The seat **42** may also be configured with a hinge so as to allow seat **42** to be adjustable between an inclined position and a recumbent position, the seat **42** being pivotally adjustable about a third pivot axis **47***a*. The seat **42** and the back rest **44** are preferably defined as being cushioned. When seat **42** and back rest **44** are positioned in the recumbent position, the user may simultaneously perform a crunching exercise and engage a resistance assembly **60** of the adjustable resistance mechanism **110** using user's feet.

The pivot control unit **45** is electrically connected to a pivot drive mechanism **50**, shown herein as a motor, but may include other drive mechanisms or assemblies such as hydraulic. Pivot drive mechanism **50** may be suitably secured to a cross beam **51** mounted perpendicularly between rear support **16**. Pivot control unit **45** controls the pivot drive mechanism **50** to pivotally raise and lower the back rest **44** about pivot axes **46** and **47** via a conventional mechanism, or assembly as is known in the art for pivotally raising and lowering structures, such as via rotation of a drive cam **49** or reel by motor, the cam **49** mounted to a first and second axle defined respectively as pivot axes **46** and **47**. Pivot control unit **45** may also control the pivot drive mechanism **50** to pivotally raise and lower the seat **42** portion of seat assembly about pivot axis **47***a*.

The pivot control unit **45** includes a plurality of pivot control buttons **48** by which user may depress or input a selectively-desired back rest **44** pivotal position. Once the desired back rest **44** position is achieved, user releases button **48** causing back rest **44** to remain stationary in the selected pivotal orientation.

As previously described, the electric drive assembly **70** is actuated for sliding the seat assembly **40** axially along the frame **12** for varied position adjustment. The electric drive assembly **70** comprises a motor **72**, such as a DC motor. The electric drive assembly **70** is suitably mounted to a drive assembly support member **97** mounted or welded perpendicularly across rear support members **16***a*, **16***b*.

A pair of stationary rails **52**, **53** is mounted respectively to the outer sidewall of rear support members **16***a*, **16***b* via a mounting bracket **16***c*, **16***d*. Each rail **52**, **53** having an elongated cover plate **54**, **55** secured to an upper surface thereof. A rail support **56** is mounted or welded perpendicularly across rear support **16** and cover plates **54**, **55**, wherein rail support **56** being oriented distally forward of drive assembly support member **97**.

Each elongated cover plate **54**, **55** includes a pair of guide rod mounts **57** mounted spatially along the upper surface thereof, each the guide rod mounts **57** pair having a guide rod **92** mounted therebetween and oriented generally parallel to the pair of stationary rails **52**, **53**, respectively.

A seat platform **58**, suitably mounted to the underside of seat **42**, comprises a pair of feet **59** molded integral or mounted to opposing lower surface corners thereof. The feet **59** being slidably mounted to respective guide rods **92** for longitudinal translation therealong. More specifically, each foot **59** each includes a guide hole **90** through which a respective guide rod **92** slidably engages.

Seat platform **58** further comprises a pair of caster assemblies **240** mounted to opposing bottom side, forward corners of seat platform **58**, the caster assemblies **240** each comprising a caster **242** or wheel for rotatably engaging an upper surface of front support members **14***a*, **14***b*, respectively, of front support **14** of frame **12**. The front support members **14***a*, **14***b* providing bearing surfaces on which the casters **242** rotatably engage in a concurrent, cooperative manner with the feet **59**, as feet **59** translate longitudinally along respective guide rods **92**. Each of the pair of caster assemblies **240** may be any suitable commercially available product that typically includes a rubber wheel or caster **242** that rotates about a horizontal (rolling motion) axis.

A seat control unit **94**, electrically connected to the electric drive assembly **70**, controls axial translation of seat **42** along guide rods **92**. Seat control unit **94** includes a plurality of directional control buttons **96** by which user may signal the electric drive assembly **70** to actuate forward and reverse translation of seat **42** in accordance to user's longitudinal seat **42** position preference.

While one particular variety of seat adjustment assembly has been specifically described in detail, it will be appreciated that numerous other types of adjustment means and mechanisms could be substituted for the adjustment assembly **70** illustrated and describe hereinabove. Alternate adjustment means and mechanisms are therefore deemed to be within the scope of the present invention.

Referring now more specifically to FIGS. **2-3**, and **11**, the resistance assembly **60** comprises pedals **62**, **64**, such as rotatable pedals or stepping pedals, connected to the adjustable resistance mechanism **110** which applies a constant resistance or work load. The resistance mechanism **110** may be a conventional mechanism or system as is known in the art for applying a resistance or load, such as an eddy current resistance assembly presently used in other exercise machines.

In accordance to one resistance assembly **60** embodiment, the pair of rotatable pedals **62**, **64** is connected to the adjustable resistance mechanism **110**, the pair of pedals **62**, **64** being operated by corresponding feet of user. The pair of pedals **62**, **64** each includes a stirrup **68**, **69**, respectively, for holding a foot when foot is placed on an upper side of the pedal **62**, **64**. Ends of each the stirrups **68**, **69** are connected to outer ends of pedals **62**, **64**, respectively.

The pedals **62**, **64** are mounted to a pedal axle **65** via respective crank arms **66**, **67**. The pedals **62**, **64** are rotatable about a common pivot axis **70** defined as the pedal axle **65**.

To provide resistance to the rotatable movement of the pedals **62**, **64**, a variable or an adjustable resistance mechanism **110** is provided. While only one embodiment of the adjustable resistance mechanism **110** is being described in detail, it will become apparent that a number of known resistance means and devices could be readily employed with the present invention. One such resistance means would be an eddy current resistance assembly presently used in other exercise machines.

In accordance to one preferred embodiment, the adjustable resistance mechanism **110** comprises a drive system **112** which includes a DC motor **113**, a drive reel **115**, and a belt **117** or cable. The DC motor **113** is powered via a power

source, such as a supply of electrical power or current. The power source may include a standard electrical wall outlet (not shown), rechargeable battery or batteries, or some other suitable means for providing the electrical input required to power and operate the DC motor **113**.

The drive reel **115** is mounted to pedal axle **65**. The drive reel **115** and DC motor **113** are connected via the belt **117**. The belt **117** is looped around drive reel **115** and connected to DC motor **113**, such as via a pinion gear. The adjustable resistance mechanism **110** is enclosed by a housing **119**, the housing **119** comprising a front member **119***a* mounted perpendicular to a forward end thereof, and a rear member **119***b* mounted perpendicular to a rearward end thereof.

An electronic control unit **120** is electrically connected to DC motor **113** for controlling the DC motor **113** to rotate drive reel **115**. The electronic control unit **120** includes a plurality of control buttons **121** by which user may input a selectively-desired resistance or work load. After inputting a selectively-desired resistance or work load, the selected resistance is then imposed by the electronic control unit **120** to control DC motor **113** to rotate the drive reel **115**, thereby controlling displacement of the belt **117** or the degree of resistance imposed thereon, and thereby applying a desired resistive force to the pedals **62**, **64**.

The DC motor **113** can be driven selectively in either a forward or a reverse rotative direction. With the foregoing capabilities, the DC drive motor **113**, the belt **117**, and drive reel **115**, when appropriately controlled, establishes the tension force supplied by the drive system **112** to the pedals **62**, **64**.

In accordance to an alternate embodiment, the adjustable resistance mechanism **110** may comprise an electronic resistance unit. The electronic resistance unit is electrically operated to apply a magnetic force to the belt **117**. The magnetic force applied by the electronic resistance unit to the pulley belt **117** is directly controlled by a supply of electrical power or current to the electronic resistance unit. The power source may include a standard electrical wall outlet (not shown), rechargeable battery or batteries, or some other suitable means for providing the electrical input required to power and operate the electronic resistance unit. An electrical current control unit, equipped with appropriate instrumentation including a microchip or computer processing unit (CPU), controls the supply of electrical current to the electronic resistance unit. The electrical current control unit may be suitably disposed within the housing **119**. The electrical current control unit may further comprise memory and a storage device(s) such as a hard disk and a portable storage device(s), wherein the CPU, memory and the storage device(s) coupled to communicate with one another. The electrical current control unit is programmed to provide a constant level of work required to move the belt **117** regardless of the rotational speed the belt **117** is moving. This programming is well known to one of ordinary skill in the art. The constant level of work required to move the belt **117** in accordance to user's desired level of resistance is then imposed by the electrical current control unit by appropriately increasing or decreasing the resistance imposed on belt **117**.

The carriage assembly **19** functions to allow the adjustable resistance mechanism **110** to be vertically adjustable generally about an incline plane, thereby allowing for various selectively-desired vertical setting positions of the pedals **62**, **65**.

A carriage control unit **100**, electrically connected to a driving means **106**, controls bi-directional rotation of guide rod **32**, and thus controls inclined translation of carriage assembly **19** about incline plane, and hence adjustable resistance mechanism **110**, along tracks **20**, **22**. Carriage control unit **100** includes a plurality of translation control buttons **102** by which user may actuate translation of pedals **62**, **64** to a selectively-desired inclined height. Driving means **106** may comprise a motor, such as a DC motor, a brushed DC motor, or a servomotor. The driving means **106** is powered via a power source, such as a supply of electrical power or current. The power source may include a standard electrical wall outlet (not shown), rechargeable battery or batteries, or some other suitable means for providing the electrical input required to power and operate driving means **106**. The driving means **106** is securably mounted to a longitudinal member **107**, the longitudinal member **107** mounted between first and second vertical member **11***a* and **11***b* of carriage assembly support frame **11**. Upon activation of carriage assembly **19** via carriage control unit **100**, guide rollers **27** of carriage **19** traverse tracks **20**, **22**, and collar **29** translates along guide rod **32** in a concurrent manner.

In reference to FIGS. **1**, **4**, **5**, and **6**, the geometry and orientation of the seat **42**, pedals **62** and **64**, and the pivot axes **46**, **47** are oriented relative to one another so that, regardless of the size of the person using the exercise machine **10**, once properly adjusted, the resulting movement and form during body conditioning is biomechanically optimized and efficient. In addition, when seat **42** is positioned in the recumbent position, the user may simultaneously perform a crunching exercise and rotatably move the pedals **62** and **64**, thereby placing user in the most biomechanically, optimized position for achieving cardiovascular fitness and burning calories.

Referring now to FIGS. **1**, **10**, and **12-14**, an input means **150**, such as a display panel **152**, shown herein as a touch sensitive screen **156** (to be described later in greater detail) is provided so as to allow users to input a desired level of resistance or work load. The input means **150** is adapted and configured so as to allow a user to input a selectively-desired resistance or work load by inputting data via the input means **150**, thus, input means **150** provides a tactile interface through which a user may input a desired level of resistance or work load. Hence, input means **150** further provides an auxiliary or alternative means for controlling resistance or work load (electronic control unit **120** providing previously described means for controlling resistance or work load). Input means **150** comprises a resistance control module **122** equipped with appropriate instrumentation including a microchip or computer processing unit (CPU) **124** connected to DC motor **113**, the module **122** programmed to allow resistance data input. Control module **122** may be suitably disposed within a housing **151** supporting display panel **152**. Control module **122** further comprises memory **125** and a storage device(s) **126** such as a hard disk **126***a* and a portable storage device(s) **126***b*, wherein the CPU **124**, memory **125** and the storage device(s) **126** coupled to communicate with one another. The control module **122** is programmed to allow user to input a desired level of resistance or work load imparted by pedals **62**, **64** via the adjustable resistance mechanism **110**. This programming is well known to one of ordinary skill in the art.

Data is input by engaging (gently pressing/deforming) and/or slidably engaging the touch sensitive screen **156** of input means **150**. The input means **150** is coupled to the memory **125** and in communication therewith, and wherein the memory **125** and the CPU **124** are responsive to the input means **150**.

The motor's **113** rotational speed is detected by a sensor **127** in connection with resistance control module **122**. The sensor **127** communicates detected motor rotational speed to a transceiver **128** being in connection therewith, the trans-

ceiver **128** transmits a motor rotational speed signal which is received by a transceiver **129** in connection with control unit **122**, the CPU **124** directs resistance control module **122** to apply an appropriate force to the motor **113**, such as a magnetic force, so as to increase or decrease rotation of motor **113**. The appropriate magnetic force is defined as the resistance or work load measure being consistent with the resistance or work load measure input by user via the input means **150** prior to beginning an exercise interval.

Resistance or frictional torque measure **154** can be provided in numerical units, indicating a measure of watts, to be displayed on the touch sensitive screen **156**, thereby providing user with real time visual monitoring of the resistance measure as user uses the exercise machine **10** during an exercise interval.

In order to facilitate the display of resistance measure **154** by touch sensitive screen **156**, transceiver **129** of resistance control module **122** transmits the received motor rotational speed signal to an indicator drive **160** in connection with transceiver **129** (via a local bus **164** and memory **125**), the indicator drive **160** enables the motor rotational speed signal to be displayed on the touch sensitive screen **156** as a resistance or frictional torque measure **154**, e.g. 50 watts. While, the touch sensitive screen **156** is the preferred type of display panel, other display panels may be utilized for the limited purpose of displaying data, such as a liquid crystal display (LCD) display panel (not shown) and a light-emitting diode (LED) display panel (not shown).

The touch sensitive screen **156** can be adapted for providing other information to user. Such information may include, but is not limited to rpm level, work output, calories consumed, heart rate, wattage, distance, pace data, duration of workout interval, and the like.

It is envisioned input means **150** may be further adapted and configured so as to allow a user to input a selectively-desired inclined height of pedals **62**, **64**. In accordance to this particular embodiment, a translation control module is programmed to allow user to input a desired height level of carriage assembly **19**, and thus pedals **62**, **64**. Translation control module outputs a signal to CPU **124** which directs carriage assembly **19** to translate about an incline plane in accordance to the selectively-desired pedals **62**, **64** inclined height level or measure input by user via the input means **150**.

The use of the carriage control unit **100** or resistance control module **122**, each being functionally settable to control the amount of work done by user via the pedals **62** and **64**, concurrently with lying in a recumbent position in seat **42** and performing crunching exercises enables a precise programming designed to maximize the possibility of a user reaching the highest, optimized levels of cardiovascular fitness and calorie burning during a physical exercise interval.

Referring now to FIGS. **1**, and **15-16**, secured laterally outboard of the seat **42** is a pair of adjustable handles **130** and **132**. The handles **130**, **132** may be suitably mounted to the frame **12**, generally about central support members **15***a*, **15***b* of central support **15**, or between central support members **15***a*, **15***b* of central support **15** and rear support **16** members **16***a*, **16***b* of rear support **16**. Alternatively, handles **130**, **132** may be suitably mounted to seat **42**.

The handles **130**, **132** each define an elongated configuration having a rearward end **133**, **134**, a body portion **135**, **136**, and a forward end **137**, **138** terminating into an inwardly curved grip **140**, **141** oriented perpendicular with respect to body portion **135**, **136**. The grips **140** and **141** may be covered with a cushioned sleeve **142**, **143**.

Means are provided for allowing the handles **130** and **132** to pivotally move electromechanically between raised and lowered positions. In accordance to one embodiment, means for allowing pivotal movement by handles **130** and **132** may include an axle **170** extending from the rearward end **133** of first handle **130**, through seat **42** and into the rearward end **134** of second handle **132**. One end of axle **170** is mounted with a hub **172** driven by a pinion gear **174** connected to a reversible actuator **180**, the reversible actuator **180** being electrically connected to a plurality of control buttons **184** for actuating simultaneous pivotal movement by the handles **130** and **132** between raised and lowered positions. The actuator **180** is suitably mounted inside a chamber **182** provided in one of the rearward ends **133** and **134** of the handles **130** and **132**, respectively. The control buttons **184** may be disposed along the body portion **135** of the first handle **130** or the body portion **136** of the second handle **132**, the control buttons **184** are oriented in a position providing user with quick, easy, and efficient access thereto.

Referring now to FIGS. **1** and **10**, and more particularly to FIGS. **13** and **14**, the input means **150** comprises a display panel **152** comprising a touch sensitive screen **156**, wherein display panel **152** is mounted via a base support **190** to the panel adjustment assembly support **200** which is securably mounted, such as by arc welding, transversely to the upper surface of track **20** and sidewall of cross member **28**. Base support **190** includes means for providing omnidirectional positionability of the display panel **152**, the omnidirectional positionability of display panel **152** affords important, unanticipated, nonobvious functional utility to the present invention.

The base support **190** includes a panel adjustment assembly **191** comprising a first pair of legs **192** hingedly coupled to base support **190**, the first pair of legs **192** biased by a first pair of biasing members **193**, respectively, pivotally secured about a forward wall of each respective leg **192**. The biasing members **193** bias the first pair of legs **192** in a generally vertical position. Upper ends of the first pair of legs **192** are pivotally coupled to a pivot header **195** comprising a pair of plates **196** between which a second pair of legs **198** are pivotally coupled about lower ends thereof. The second pair of legs **198** is biased in a generally vertical position by way of a pair of spring members **199** extending between the legs **198** and respective plates **196**. The spring members **199** have one end respectively secured to the pair of plates **196** and an opposing end respectively secured about a mid-length of the pair of legs **198**.

Upper ends of the second pair of legs **198** is pivotally coupled to a pivot bracket **202**, the pivot bracket **202** may comprise a generally triangular configuration. An arm **204** pivotally secures display panel **152** to pivot bracket **202**. The arm **204** having a lower end pivotally mounted to a pivot bracket **202**, and an upper end having a joint assembly **206** adjustably connecting a rear side **153** of display panel **152** thereto. Joint assembly **206** comprises a ball and socket joint assembly **207** comprising a ball portion **208**, a socket portion **210**, and a shaft **212**. The socket portion **210** is molded integral to upper end of arm **204**, wherein the ball portion **208** seats in and is rotatable within the socket portion **210**. The shaft **212** has a first end extending integrally from the ball portion **202** and a second end mounted to the rear side **153** of display panel **152**, such as via a mounting plate.

The panel adjustment assembly **191** allows the input means **150**, shown herein as display panel **152**, to be positioned omnidirectionally and maneuvered in accordance to user's needs, preferences, and desires. The omnidirectional positionability of the display panel **152** via the panel adjustment assembly **191** further allows the touch sensitive screen **156** to be easily accessed particularly after user has adjusted seat **42**

and/or back rest **44** in accordance to user's body dimension, comfort, fit, and exercise program needs.

Finally, in reference to FIG. **5**, at least one beverage holder **220** may be provided for supporting a beverage container, such as a cup or bottle. The beverage holder **220** may be suitably attached to the base of the seat **42**.

It is envisioned that the various embodiments, as separately disclosed, are interchangeable in various aspects, so that elements of one embodiment may be incorporated into one or more of the other embodiments, and that specific positioning of individual elements may necessitate other arrangements not specifically disclosed to accommodate performance requirements or spatial considerations.

It is to be understood that the embodiments and claims are not limited in its application to the details of construction and arrangement of the components set forth in the description and illustrated in the drawings. Rather, the description and the drawings provide examples of the embodiments envisioned, but the claims are limited to the specific embodiments. The embodiments and claims disclosed herein are further capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purposes of description and should not be regarded as limiting the claims.

Accordingly, those skilled in the art will appreciate that the conception upon which the application and claims are based may be readily utilized as a basis for the design of other structures, methods, and systems for carrying out the several purposes of the embodiments and claims presented in this application. It is important, therefore, that the claims be regarded as including such equivalent constructions.

Furthermore, the purpose of the foregoing Abstract is to enable the U.S. Patent and Trademark Office and the public generally, and especially including the practitioners in the art who are not familiar with patent and legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The Abstract is neither intended to define the claims of the application, nor is it intended to be limiting to the scope of the claims in any way. It is intended that the application is defined by the claims appended hereto.

What is claimed is:

1. An exercise machine comprising:

a frame, the frame includes a front support, a central support, and a rear support, the front support and the rear support are integrally joined by the central support, and wherein the front support is spaced from the rear support generally along a central axis;

a seat assembly;

means for slidably adjusting the seat assembly axially along the frame, the means for slidably adjusting the seat assembly comprises:

an electric drive assembly, the electric drive assembly being actuated for sliding the seat assembly axially along the frame, thereby allowing for varied axially-positioned adjustment of the seat assembly; and

a seat control unit, the seat control unit is electrically connected to the electric drive assembly, the seat control unit controls axial translation of the seat assembly by signaling the electric drive assembly to actuate forward and reverse translation of the seat assembly in accordance to a user's longitudinal seat position preference;

means for pivotally adjusting the seat assembly between a generally upright position and a recumbent position, the means for pivotally adjusting the seat assembly comprises a pivot control mechanism;

a resistance assembly, the resistance assembly comprises:

first and second pedals; and

an adjustable resistance mechanism, wherein the first and second pedals are connected to the adjustable resistance mechanism for operation therewith, the first and second pedals are rotatably operated by corresponding feet of the user, the adjustable resistance mechanism provides resistance to the rotatable movement of the first and second pedals, and wherein the adjustable resistance mechanism comprises an electronic control unit electrically connected thereto, the electronic control unit includes a plurality of control buttons by which the user inputs a selectively-desired resistance or work load, the electronic control unit selectively controls a measure of resistance or work load imposed by the adjustable resistance mechanism;

an input means, the input means comprising means for providing omnidirectional positionability of the input means;

a carriage assembly support frame, the carriage assembly support frame comprises a first vertical member and a second vertical member, the first vertical member and the second vertical member each includes an upper end and a lower end, the lower end of the first vertical member and the lower end of the second vertical member are mounted to the front support of the frame, the upper end of the first vertical member and the upper end of the second vertical member are welded or molded integral to a cross member, the first vertical member has an outer wall to which a first stanchion is mounted or welded, and the second vertical member has an outer wall to which a second stanchion is mounted or welded; and

a carriage assembly, the carriage assembly is supported by the carriage assembly support frame, the carriage assembly functions to allow the adjustable resistance mechanism to be vertically adjustable generally about an incline plane, thereby allowing for various selectively-desired vertical setting positions of the first and second pedals, the carriage assembly comprises:

a transverse support rod having ends rotatably mounted with guide rollers;

a pair of tracks, the pair of tracks are respectively mounted to inner side walls of the first stanchion and the second stanchion, the pair of tracks each comprises a pair of flanges joined by a central web, the flanges provide bearing surfaces on which the guide rollers rotatably engage, the pair of tracks each further defines curved lower ends, the pair of tracks having upper ends mounted to a cross member; and

a pair of support brackets for securably supporting the adjustable resistance mechanism, the pair of support brackets is mounted spatially about the transverse support rod and include a lower surface edge to which a front member of a housing of the adjustable resistance mechanism is suitably mounted, the pair of support brackets includes inner walls joined by an annular collar suitably mounted therebetween for threaded translation along a guide rod, the guide rod is rotatably mounted perpendicularly between the cross member, mounted to upper ends of the pair of tracks, and a receiver being mounted to the front support, wherein the guide rod includes male threads being threadedly engaged by the annular collar, the guide rod is electrically connected to a driving device,

whereupon actuation of a driving device causes the guide rod to rotate either clockwise or counterclockwise, and upon rotation by the guide rod in one direction causes the annular collar to translate about the guide rod in a sloped or inclinational direction, thereby causing the adjustable resistance mechanism to translate in one inclinational direction, and rotation by the guide rod in the opposite direction causes the adjustable resistance mechanism to translate in the opposite inclinational direction.

2. The exercise machine of claim **1**, further comprising a panel adjustment assembly support securably mounted transversely to an upper surface of one of the pair of tracks and a sidewall of the cross member to which the upper ends of the pair of tracks is mounted, and wherein the input means is mounted via a base support to the panel adjustment assembly support, the base support includes means for providing omnidirectional positionability of the input means.

3. The exercise machine of claim **2**, wherein the input means includes a tactile interface through which the user inputs a desired level of resistance or work load.

4. The exercise machine of claim **3**, wherein the input means comprises a touch sensitive screen, the input means providing an auxiliary means for controlling resistance or work load imposed by the adjustable resistance mechanism, and wherein the touch sensitive screen via the tactile interface allows the user to input a selectively-desired inclined height of the first and second pedals.

5. The exercise machine of claim **1**, further comprising a shroud portion extending between the front support and the central support of the frame, the shroud portion partially encloses the carriage assembly and the adjustable resistance mechanism.

6. The exercise machine of claim **5**, wherein the shroud portion comprises a generally conical shape having an elongated sloped forward segment.

7. The exercise machine of claim **1**, wherein the seat assembly comprises a seat portion, a back rest, and a pivot control unit, wherein the back rest being pivotally adjustable automatically about a first pivot axis and a second pivot axis via actuation of the pivot control unit, the pivot control unit is electrically connected to a pivot drive mechanism, the pivot drive mechanism is suitably secured to a cross beam mounted perpendicularly between the rear support, the pivot control unit controls the pivot drive mechanism to pivotally raise and lower the back rest about the first pivot axis and the second pivot axis, the pivot control unit controls the pivot drive mechanism to pivotally raise and lower the seat portion of the seat assembly about a third pivot axis, and wherein the pivot control unit includes a plurality of pivot control buttons by which the user depresses or inputs a selectively-desired back rest pivotal position.

8. The exercise machine of claim **7**, wherein the seat portion and the back rest are positionable to a recumbent position, thus allowing the user to simultaneously perform a crunching exercise and rotatably engage the resistance assembly via the first and second pedals, thereby placing user in a most biomechanically, optimized position for achieving highest, optimized levels of cardiovascular fitness and calorie burning during a physical exercise interval.

9. The exercise machine of claim **1**, further comprising a pair of adjustable handles, the pair of adjustable handles respectively secured laterally outboard of the seat assembly.

10. The exercise machine of claim **9**, further comprising means for pivotally moving the pair of adjustable handles electromechanically between raised and lowered positions.

11. The exercise machine of claim **1**, wherein the carriage assembly further comprises a carriage control unit for controlling inclined translation of the adjustable resistance mechanism about the incline plane, the carriage control unit is electrically connected to the driving device, the carriage control unit controls bi-directional rotation of the guide rod, and thus the carriage control unit controls inclined translation of the carriage assembly about the incline plane, and hence the carriage control unit controls inclined translation of the adjustable resistance mechanism along the pair of tracks, and wherein the carriage control unit includes a plurality of translation control buttons by which the user actuates translation of the first and second pedals to a selectively-desired inclined height.

12. An exercise machine comprising:

a frame, the frame includes a front support, a central support, and a rear support, the front support and the rear support are integrally joined by the central support, and wherein the front support is spaced from the rear support generally along a central axis;

a seat assembly;

means for slidably adjusting the seat assembly axially along the frame;

means for pivotally adjusting the seat assembly between a generally upright position and a recumbent position;

a resistance assembly;

an input means, the input means comprising means for providing omnidirectional positionability of the input means, the means for providing omnidirectional positionability of the input means comprises:

a panel adjustment assembly comprising:

a base support;

a first pair of legs;

a second pair of legs;

a pivot header;

a pivot bracket; and

a joint assembly, wherein the first pair of legs is hingedly coupled between the base support and the pivot header, the pivot header comprising a pair of plates between which the second pair of legs is pivotally coupled, the second pair of legs is pivotally coupled about upper ends thereof to the pivot bracket, the joint assembly adjustably connecting a rear side of the input means to the pivot bracket, wherein the input means is pivotally secured to the pivot bracket via an arm, the joint assembly comprises a ball and socket joint assembly comprising a ball portion, a socket portion, and a shaft, the socket portion is molded integral to an upper end of the arm, wherein the ball portion seats in and is rotatable within the socket portion, the shaft has a first end extending integrally from the ball portion and a second end mounted to the rear side of the input means;

a carriage assembly support frame; and

a carriage assembly, the carriage assembly is supported by the carriage assembly support frame, the carriage assembly functions to allow an adjustable resistance mechanism of the resistance assembly to be vertically adjustable generally about an incline plane, the carriage assembly comprises:

a track assembly; and

a carriage control unit for controlling inclined translation of the adjustable resistance mechanism along the track assembly.

13. The exercise machine of claim 12, further comprising a beverage holder suitably attached thereto.

* * * * *